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ABSTRACT

A study tested two hypotheses: (1) that an inservice training program will alter teacher verbal behavior and (2) that this altered behavior will be associated with increased pupil achievement. Subjects were elementary teachers in two buildings, one the experimental (23) and one the control group (20) and their pupils in grades 1 through 5 (596 experimental and 594 control). Pretests included intelligence tests and Stanford Achievement Tests in arithmetic for students and the Teaching Situations Reaction Test (TSRT) for teachers; teachers were observed (via Flanders' interaction analysis) during six 15-minute sessions of arithmetic instruction. There were no statistically significant differences between the two groups in pupil ability or achievement or teacher behavior. An inservice training program administered to experimental teachers during the semester consisted of 14 hours' instruction in skills to develop a positive social-emotional climate. Included was use of interaction analysis as a feedback technique and emphasis on 14 behavioral variables to be "trained-in" and "trained-out." Ten trained and statistically reliable observers collected interaction analysis intermediate and post data on teacher behavior (186 hours of observation). Data was subjected to t test analysis. Hypothesis 2 was rejected on the basis of achievement posttests. Hypothesis 1 was partially accepted: five of the seven train-in variables accepted, all seven train-out variables rejected. (JS)

An Investigation of the Relationships Between Various Verbal Strategies of Teaching Behavior and Achievement of Elementary School Children

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An Investigation of The Relationships Between Various Verbal Strategies of Teaching Behavior and Achievement of Elementary School Children

Introduction

The major objectives of this investigation were (a) to determine the effect of an in-service training program on teacher use of selected verbal behaviors and (b) to determine the relationships between those behaviors and the achievement of pupils in arithmetic. The study tested singly and in combination two major hypotheses: (1) that an in-service training program will alter teacher verbal behavior and (2) that this altered behavior on the part of the teachers will be associated with increased pupil achievement.

To date there has been no research on whether modifying teacher behavior affects pupil achievement. It was the purpose of this investigation to determine if an in-service training program designed to change teacher behavior could produce change and if that change could be related to increased pupil achievement.

Many studies regarding teacher behavior and pupil achievement, focused upon the natural style of the teacher. This is to say that the researchers recorded the verbal behavior of the teacher as it was elicited as a natural consequence of education, experience, and personality with no attempt to influence this natural style as a part of the experimental design.

A number of studies have been concerned with training teachers to modify their behavior. They have used interaction analysis as a training technique, and for comparing the verbal behavior of those trained with a control group not trained in interaction analysis. This contrasts with the above studies

which dealt with natural teacher verbal style, and using interaction analysis solely to assess this style. Evidence that teacher verbal behavior modification through training is possible has been provided by several investigators.

It is appropriate at this time to point out that the study conducted by this writer dealt with trained teacher behavior. In this study the teachers in the experimental school participated in an in-service training program designed to influence their verbal behavior patterns through the process of "training-in" and "training-out" behaviors, not to simply teach them interaction analysis This trained behavior, when examined in conjunction with student achievement, provided additional information regarding the influence that teacher verbal behavior had on climate and subsequently on pupil achievement.

Of significance is the fact that few studies are available regarding the effect of an intensive, well presented, in-service training program upon the verbal teaching behavior of those participating in the training. As a further consequence, little data is available regarding the effect that such an in-service training program for teachers has upon the achievement of pupils.

A number of studies have indicated a relationship between the social-emotional climate in which teaching-learning takes place and pupil attitudes and achievement. Additional studies indicate that classroom teacher behavior can be modified so that it is consistent with behavior emitted in classrooms with a positive social-emotional climate. On the basis of prior research there is a need to extend the assumptions that teacher behavior is related to climate, that modifying teacher behavior changes climate, and that climate is related to pupil achievement. This extension appears to be a need to demonstrate that pupil achievement is effected by modifying teacher behavior thus modifying climate. To help accomplish this extension the present study

included an intensive in-service training program. The study, designed to change teacher verbal behavior thus modifying the social emotional climate in the classroom and influencing the achievement of pupils, is presented.

Instrumentation, Population, and Sample

Teachers from two elementary school buildings were used in this study. The teachers in one building participated in an in-service training program and were designated as the experimental group. Teachers in the other building did not participate in the in-service training and constituted the control group. Pupils of experimental and control teachers in grades one through five were the subjects whose achievements in mathematics was studied. In an attempt to insure that the two schools were comparable, demographic information regarding the teachers, was gathered and used as control data. In addition pupil abilities as measured by an intelligence test were compared. A statement attesting to the fact that the two schools are comparable in terms of curriculum, instructional materials, educational philosophy, and the communities that the school serve was obtained from the school district's central administration. As a further control, the Teaching Situation Reaction Test (TSRT) was administered to both the experimental and control teachers at the beginning and end of the study.

Twenty-three experimental teachers and twenty control teachers participated in the study. In order to eliminate inter-building experimental contamination, all classroom teachers in the two buildings participated on a required basis.

The Flanders technique and category system of verbal behavior was used as a measure of teacher verbal behavior. Appropriate batteries of levels of the Stanford Achievement Test were used as a measure of pupil achievement in arithmetic. The in-service training program was designed to teach skills and techniques to the teachers that would enable them to provide a positive social-emotional learning climate. The workshop emphasized skill for teachers in employing various teaching behaviors and in analyzing and assessing their own verbal behavior in the classroom.

The tests to determine mathematics achievement levels were administered to pupils of both experimental and control schools in September. All teachers involved in the investigation were observed by trained recorders who gathered data regarding verbal interaction patterns in the classroom.

Procedures

As soon as possible after the opening of school in September all students (experimental and control) were given the mathematics section of the Stanford Achievement Test. All teachers (experimental and control) were observed during the last week of September and the first two weeks in October. These observations occurred during mathematics classes and consisted of six 15-minute sessions for each teacher. To insure a representative sampling of teacher behavior two observations were conducted at the beginning of a lesson, two during the middle of a lesson, and two during the latter phases of a mathematics lesson. No recorder observed the same teacher more than twice during any of the three data gathering sessions.

Investigation of the control data revealed that there was no statistically significant difference between the two groups at the .05 level with respect to pupil ability, pupil achievement in mathematics, teacher response to the TSRT, and the fourteen teacher verbal behavior variables to be tested.

The intensive in-service training program was administered to the staff of the experimental school during the first semester of the school year. This program consisted of fourteen hours instruction and experiences designed to create skill in the development of a positive social-emotional classroom climate. Training in the use of interaction analysis as a feedback technique for teachers and supervisors for the determination of degrees of success or failure in using certain verbal strategies toward the development of that climate was included in the program. Flanders System of Interaction Analysis was used as the major training vehicle of instruction and for gathering data regarding teacher verbal behavior patterms.

Fourteen training variables were introduced to the experimental group and related behavior "trained-in" and "trained-out". These fourteen variables were also used as hypotheses to study verbal behavior change during the course of the investigation.

Collection of the verbal behavior data was done by ten trained observers. The observers participated in a minimum of twelve hours of training and were reliable at the .80 level of the Scott Coefficient or higher. Refresher sessions for the observers were held prior to the intermediate and post data gathering sessions to insure continued reliability.

Interaction analysis for each subject and building was plotted and the appropriate column totals and percentage were computed by means of a specially prepared computer program. All data needed for testing the fourteen teacher behavior hypotheses were tested by means of a "t" Test program.

A mean percent score for each of the fourteen training variables was calculated for the experimental and for the control building. The use of these selected verbal behaviors by the teachers of the two buildings was compared by both a within and between group "t" Test Analysis of the difference between means.

Conclusions

The pupil achievement hypothesis states that there will be greater improvement in mathamatics of pupils in the experimental school where teachers have been engaged in an intensive in-service training program designed to change their verbal behavior patterns, as compared with pupils in the control school where teachers had not been trained. This hypothsis was rejected.

The in-service training program apparently was more successful in "training-in" behavior (five of the seven train-in variables accepted), than in "training-out" (all seven train-out variables rejected).

This study gives further support to the previous findings that an intensive in-service training program can change teacher behavior in a predicted direction. However, this study failed to show any connection between changed teacher behavior and increased pupil achievement since the pupil achievement hypothesis was rejected.

The conclusions from this study are based upon 232,200 tallies recorded for the total sample during 186 hours of observations by ten statistically reliable observers. The conclusions regarding student achievement variables were gathered from pre and post achievement results of 1190 students in grades one through five. There were 594 students in the control group and 596 in the experimental group.

Significant probabilities were obtained in five of the seven train-in teacher training hypotheses of this study. The results of this investigation show that an intensive in-service training program can cause change. More specifically, the experimental group of teachers who were trained to elicit certain verbal patterns did differ significantly from the control group of teachers not so trained.

Implications

It is imperative that the "product" of our educational programs be assessed in terms other than generalized standardized achievement tests as we know them today. More attention must be given to other areas of child growth and development, such as problem solving skills, group process skills, human relation skills, perception of self and of others, and physical and mental health.

Even though this study, which examined the entire staff of two buildings, indicated no difference in pupil achievement between the two groups, and that the experimental group of teachers did change in comparison to the control group on some variables, there is a need to look within each group of teachers and identify those who were direct or indirect and those who did or did not change. Also, there is a need to compare teachers with the achievement change of children in their classroom.

If indirect teachers as compared to direct teachers are in fact the ones that have a greater "positive" effect upon pupils and since this investigation shows that training an entire staff does not improve the achievement, perhaps this indirectness could be trained for or identified early in the pre service teacher preparation program. This may imply some type of selection process to determine

those candidates for teaching who may be better risks to produce "desired" teacher behavior and ultimately increase pupil achievement.

This study had opened to question the results of some earlier reports regarding teacher influences upon pupil achievement. It has failed to demonstrate the link between teacher training, teacher behavior modification, and subsequent student achievement. Teacher educators who train beginning or in-service teachers to use increased proportions of indirect teacher verbal behavior to effect student achievement have been given no support by this study. This study has also provided some information and questions regarding the influence of in-service training upon teacher's classroom behavior. It indeed points out the need for a much deeper, more sophisticated investigation regarding the teaching act, the kind of person performing that teaching, and what types of children are affected by what types of teachers.